IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of:
Koji HIRAMATSU

Application No.: 10/825,667 Group Art Unit: 3654

Filed: April 16, 2004 Examiner: Scott J. Haugland

For: SEAT BELT RETRACTOR

APPEAL BRIEF UNDER 37 CFR § 41.37

January 25, 2007

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal Brief is filed pursuant to 37 CFR § 41.37. A credit card authorization form in the amount of $500.00 is attached herewith for the Appeal brief fee.

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REAL PARTY IN INTEREST

The real party in interest is Takata Corporation.

RELATED APPEALS AND INTERFERENCES

Appellant, Appellant's representative, and the Assignee of this application are aware of no other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on, the Board's decision in the pending appeal.

STATUS OF CLAIMS

This is an appeal from the final rejection of claims 1 and 3-9 as entered, in response to the Office Action of August 7, 2006.

Claim 2 was canceled.

Claims 1 and 3-9 are pending in the application. Each of claims 1 and 3-9 stands rejected, and the rejection of each of claims 1 and 3-9 is appealed.

Claims 1 and 3-9 on appeal are set forth in their entirety in the Claims Appendix attached hereto.

STATUS OF AMENDMENTS

Claim amendments presented in an after final Amendment dated October 19, 2006 were not entered as indicated in the Advisory Action of November 6, 2006.

Each of the claim amendments presented in Appellant's Amendment filed May 22, 2006, in response to the Office Action of February 28, 2006, was entered.

SUMMARY OF CLAIMED SUBJECT MATTER

As recited in claim 1, a seat belt retractor for winding and unwinding a seat belt, comprises:

a spool for winding and unwinding the seat belt,

a locking mechanism having a locking member attached to the spool to be rotatable therewith in a normal state and capable of locking the spool in an emergency state,

a torsion bar disposed between the spool and the locking member for absorbing kinetic energy of a passenger when the spool rotates in a direction that the seat belt is withdrawn relative to the locking member in an emergency situation,

a stopper screwed in a shaft of the locking member to be movable in an axial direction along the shaft of the locking member when the spool rotates relative to the locking member, said stopper locking the spool not to rotate when the locking member locks the stopper not to move in the axial direction, and

an energy-absorption pin member disposed in one of the stopper and the locking member and situated between the stopper and the locking member, said pin member being configured for shear-deformation proximate a periphery of the one of the stopper and locking member in which the pin member is disposed, when the stopper moves in the axial direction along the shaft of the locking member.

The spool 4, locking mechanism 6, and the torsion bar 7 are the same as the conventional ones as shown in Fig. 5 and described on page 2, line 22 to page 3, line 14.

As described in page 12 lines 19-28, and as shown in FIG. 1, a seat belt retractor includes a stopper 15 extending leftward from a left end of a shaft 14a of a locking base 14 in a normal state. On the extended portion of the stopper 15, a predetermined number of columnar energy-absorption pins 20 are disposed on a circumference of the stopper 15 with an equal

interval and protrude inwardly in a radial direction as energy-absorption members (EA members). The energy-absorption pins 20 are disposed separately from a torsion bar 7.

As shown in FIG. 2(a), the energy-absorption pins 20 are connected to a left end of the shaft 14a of the locking base 14. The seat belt retractor has an EA mechanism formed of the energy-absorption pins 20 and the torsion bar 7.

As described in page 13, lines 5-19, in the seat belt retractor, the spool 4 rotates in a seat belt withdrawal direction, and the torsion bar 7 twists in an emergency situation. The twisting torque of the torsion bar 7 absorbs kinetic energy of a passenger and limits load applied to the seat belt in an emergency state. At the same time, the stopper 15 rotates around the shaft 14a of the locking base 14, and tries to move to the right relative to the shaft 14a of the locking base 14. Therefore, shear load is applied to the energy-absorption pins 20 to deform in a shear mode. As the shear load increases, the energy-absorption pins 20 finally undergo shear failure. The shear deformation and shear failure of the energy-absorption pins 20 further absorb the kinetic energy of the passenger and limit the load applied to the seat belt 3.

After the energy-absorption pins 20 undergo the shear failure, similar to the conventional seat belt retractor shown in FIG. 5, only the twisting of the torsion bar 7 absorbs the kinetic energy, and the stopper 15 moves rightward relative to the shaft 14a of the locking base 14 (page 13, lines 19-24).

The EA mechanism has the following characteristic of the EA load. As shown in FIG. 3(a), as a stroke of the spool 4 relative to the locking base 14 increases, the EA load controlled through the twisting of the torsion bar 7 and the

shear deformation of the energy-absorption pins 20 gradually increases.

As described above, the energy-absorption pins 20 are disposed on the stopper 15 and are connected to the left end of the shaft 14a of the locking base 14. As shown in FIG. 2(b), and described in page 15, lines 4-15, it is also possible to dispose the energy-absorption pins 20 on the shaft 14a of the locking base 14 and connect them to the right end of the stopper 15. Furthermore, the energy-absorption pins 20 are connected to the shaft 14a of the locking base 14 in the initial state. It is also possible to position the energy-absorption pins 20 away from the left end of the shaft 14a of the locking base 14 in the initial state. After the stopper 15 moves for a predetermined distance towards the right relative to the shaft 14a of the locking base 14, the energy-absorption pins 20 are connected to the left end of the shaft 14a of the locking base 14 to deform in the shear mode.

In claim 6, it is clearly recited that the pin member is arranged to project essentially radially out of the one of the stopper and the locking member in which it is disposed, as shown in Figs. 2(a) and 2(b).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

35 U.S.C. § 103(a)

Whether claims 1 and 3-9 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent Application Publication No. 2002/0070307 to Hiramatsu et al. ("Hiramatsu") in view of U.S. Patent No. 6,416,008 to Fujii et al. ("Fujii").

ARGUMENT

35 U.S.C. § 103(a)

Claims 1 and 4

Independent claim 1 recites, *inter alia*, a seat belt retractor for winding and unwinding a seat belt, comprising "an energy-absorption pin member disposed in one of the stopper and the locking member and situated between the stopper and the locking member, said pin member being configured for shear-deformation proximate a periphery of the one of the stopper and locking member in which the pin member is disposed, when the stopper moves in the axial direction along the shaft of the locking member."

Claim 4 depends from claim 1 and recites wherein a cutter is disposed on one of the stopper and the locking member for cutting the energy-absorption pin member when the stopper moves along the shaft of the locking member.

In the rejection of independent claim 1 and dependent claim 4 under 35 U.S.C. §103(a) as being unpatentable over Hiramatsu and Fujii, the Examiner acknowledges that Hiramatsu fails to disclose an energy-absorbing pin member in the stopper or locking members or a cutter for cutting it. The Examiner relies upon Fujii to remedy the deficiencies of Hiramatsu and asserts, at page 3, paragraph 3 of the final Office Action, that "[i]t would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide Hiramatsu et al. with a energy-absorption pins in the stopper 16 and locking member 14 as taught by Fujii et al. and separate cutters to provide improved load limiting characteristics since placing the pin between the stopper and locking member would obviously have substantially the same effect as placing the pin directly

between the locking member and spool due to the rotation of the spool and stopper together." Appellant respectfully disagrees.

First, the combined disclosures of the applied art do not disclose, teach, or suggest all of Appellant's claim limitations. Nowhere does Fujii disclose, teach or suggest a stopper screwed in a shaft of the locking member to be movable in an axial direction along the shaft of the locking member when the spool rotates relative to the locking member, as recited in claim 1. Therefore, notwithstanding Fujii's disclosure of a shear pin, the absence of a stopper precludes Fujii from disclosing wherein an energy-absorption pin member operates to stop movement of the stopper in an axial direction, as recited in claim 1. As neither Fujii nor Hiramatsu disclose an energy-absorption pin, the combination of Hiramatsu and Fujii fail to disclose all elements of Appellant's seat belt retractor.

Second, notwithstanding the lack of explicit or implicit disclosure of all claimed elements in the combined disclosure of Hiramatsu and Fujii, Appellant respectfully submits that not only would the combination of the applied art fail to disclose, teach or suggest the Appellant's seat belt retractor, the combination or modification of references can not render the resultant combination obvious unless the prior art also suggest the desirability of the combination.

Hiramatsu only describes a torsion bar and stopper for absorbing the kinetic energy generated by an emergency and nowhere discloses any element that can be construed as a shear pin. Equally missing in Fujii is any disclosure or suggestion of a stopper as recited in claim 1. The only mention in Fujii

of a mechanism to stop the spool from rotating in the unwinding direction is a pawl 13 that engages inner teeth 19 of the side wall of the frame 2, a torsion bar 7, and a number of shear pins that break off at different relative rotational positions of the spool.

Appellant respectfully submits that neither Hiramatsu nor Fujii suggest the desirability, motivation or suggestion of combining such unrelated teachings. Appellant respectfully submits that the combination of Hiramatsu and Fujii is improper, and appears to be based on hindsight reasoning.

It is improper to use the claimed invention as an instruction manual to piece together the teachings of the prior art so that the claimed invention is rendered obvious. The Office Action appears to use improper hindsight reconstruction to pick and choose among isolated disclosures. Accordingly, it is respectfully submitted that the combination is improper.

Thirdly, the Appellant submits that the significant improvement in load limiting characteristics provided by the Appellant's placement of an energy-absorbing pin member in the stopper or locking members refutes the Examiner's assertion that "placing the pin between the stopper and locking member would obviously have substantially the same effect as placing the pin directly between the locking member and spool due to the rotation of the spool and stopper together." (Emphasis added).

Unlike the shear pin arrangement of Fujii that break within a relatively small angular rotation of the spool, the Appellant's shear pin in the stopper or locking member has the advantage of providing a smoother deceleration over a greater

angular displacement because the shearing of the pin is controlled by the axial displacement of the stopper, rather than by the direct rotation of the spool.

Accordingly, Appellant respectfully submits that claims 1 and 4 are patentable not only due to the failure of Hiramatsu in view of Fujii to disclose, teach or motivate all recited features of claims 1 and 4, but is also patentable based upon the improper combination of Hiramatsu and Fujii.

Claim 6

Dependent claim 6 recites, *inter alia*, wherein the pin member is configured of shear-deformation proximate a periphery of the one of the stopper and locking member in which the pin member is disposed, when the stopper moves in the axial direction along the shaft of the locking member.

The Examiner acknowledges that Hiramatsu fails to disclose an energy-absorption pin member in the stopper or locking member or a cutter for cutting it and relies upon Fujii to remedy the deficiencies of Hiramatsu. Appellant respectfully disagrees.

Fujii only appears to disclose a spool 4 disposed over a locking base 14. In an embodiment depicted in Figs. 1(a) and 1(b), the spool 4 and the locking base 14 are connected by shear pins 20, 21. Further, in Fig. 8, the spool 4 and the locking base 4 are arranged to face each other, and cut portions 31-33 are situated adjacent to cutting blades 40-42.

In both embodiments illustrated in Figs. 1 and 8, shear pins 20, 21 and cut portions 31-33 are arranged parallel to the center shaft of spool 4. Therefore, when spool 4 is rotated or withdrawn relative to locking base 4, spool 4 is angularly rotated. If spool 4 is angularly rotated for the diameter of

shear pins 20, 21, the shear pins and cut portions 31-33 are immediately cut by the rotation of the spool.

As previously submitted, the pin member of claim 6 is configured of shear-deformation proximate a periphery of the one of the stopper and locking member in which the pin member is disposed, when the stopper moves in the axial direction along the shaft of the locking member.

More clearly described, the stopper is screwed on the shaft of the locking member to move along the axial direction, and when the stopper moves in the axial direction along the shaft of the locking member, the pin member is cut because the pin member is located at the periphery of the stopper or locking member. Because the stopper slowly moves along the shaft as the spool is withdrawn, the pin member can be cut gradually along the withdrawal of the seat belt. Unlike the Appellant's device, the device of Fujii is configured such that shear pins 20, 21 and cut portions 31-33 are disposed angularly along the shaft, the shear pins and cut portions are quickly cut upon withdrawal of the spool.

Claim 6 further recites wherein the pin member is arranged to project essentially radially out of the one of the stopper and the locking member in which it is disposed. Unlike the Appellant's arrangement, Fujii discloses wherein the shear pins and cut portions are arranged parallel to the shaft. Appellant respectfully submits therefore, that Fujii fails to disclose teach or suggest the pin member arrangement, as recited in claim 6.

The Examiner asserts that it would have been obvious to make the pin member project essentially radially out of the stopper and locking member due to their concentric arrangement. Appellant respectfully disagrees.

Fujii only disclose wherein the shear pins 20, 21 and the cut portions 31-33 are arranged parallel to the shaft of the spool and are connected between the spool 4 and the locking base 14. Nowhere does Fujii, disclose, teach or suggest wherein the shear pins are provide between the stopper and the locking member and to project radially out of the stopper and locking member, as recited in claim 6.

The Examiner's opinion that it would have been obvious to make the pin member project essentially out of the stopper and locking member due to their concentric arrangement would appear to be derived from the disclosure of the invention. It is improper to use the claimed invention as an instruction manual to piece together the teachings of the prior art so that the claimed invention is rendered obvious. The Examiner appears to use improper hindsight reconstruction to pick and choose among isolated disclosures.

Appellant respectfully submits that it is not obvious to form the pin member between the stopper and the locking member, especially by changing the arrangement and the direction of the pin member. Since the obtained advantage is the gradually cutting the shear pin, claim 6 is not a mere rearrangement of the pin member.

Appellant therefore submits that neither Hiramatsu nor Fujii suggest the desirability of combining such teachings and further submits that the combination is improper. Accordingly, Appellant respectfully submits that dependent claim 6 is patentable over the applied art, either alone or in permissible combinations.

Claims 3, 5, and 7-9

Appellant respectfully submits that dependent claims 3, 5, and 7-9 are likewise patentable over the applied art at least based on their dependency on patentable claim 1, as well as for additional features they recites.

CONCLUSION

Accordingly, Appellants respectfully submit that the rejections of claims 1 and 3-9 are in error, and request that each of the final rejections be reversed.

Respectfully submitted,

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CLAIMS APPENDIX

Listing of Claims

1. A seat belt retractor for winding and unwinding a seat belt, comprising:

a spool for winding and unwinding the seat belt,

a locking mechanism having a locking member attached to the spool to be rotatable therewith in a normal state and capable of locking the spool in an emergency state,

a torsion bar disposed between the spool and the locking member for absorbing kinetic energy of a passenger when the spool rotates in a direction that the seat belt is withdrawn relative to the locking member in an emergency situation,

a stopper screwed in a shaft of the locking member to be movable in an axial direction along the shaft of the locking member when the spool rotates relative to the locking member, said stopper locking the spool not to rotate when the locking member locks the stopper not to move in the axial direction, and

an energy-absorption pin member disposed in one of the stopper and the locking member and situated between the stopper and the locking member, said pin member being configured for shear-deformation proximate a periphery of the one of the stopper and locking member in which the pin member is disposed, when the stopper moves in the axial direction along the shaft of the locking member.

3. A seat belt retractor according to claim 1, wherein said torsion bar and energy-absorption member are disposed separately.

4. A seat belt retractor according to claim 1, further comprising a cutter disposed on one of the stopper and the locking member for cutting the energy-absorption pin_member when the stopper moves along the shaft of the locking member.

5. A seat belt retractor according to claim 4, wherein said cutter includes an edge having an acute angle.

6. A seat belt retractor according claim 1, wherein the pin member is arranged to project essentially radially out of the one of the stopper and the locking member in which it is disposed.

7. A seat belt retractor according claim 1, further comprising at least one additional pin member which is disposed in one of the stopper and the locking member and which is arranged to project essentially radially with respect to the one of the stopper and the locking member in which it is disposed.

8. A seat belt retractor according claim 4, wherein the cutter is a ring-shaped element which is separate from the stopper and the locking member.

9. A seat belt apparatus comprising a seat belt retractor according to claim 1, a tang slidably inserting the seat belt, and a buckle to be attached to the tang.

EVIDENCE APPENDIX

No copies of evidence are appended hereto.

RELATED PROCEEDINGS APPENDIX

No copies of decisions are appended hereto.